WXGA-TFT-PCAP-Modul Datenblatt

Modell SCF1001XXXGGU11

Kurzdaten

Hersteller	Data Image
Diagonale	10,1" / 25,6 cm
Format	wide
Auflösung	1280 x 800
Backlight	LED / 290 cd/m²
Interface	LVDS
Touchscreen	PCAP
Temperatur	-20… +70°C (Betrieb)

Vertrieb durch:

Inselkammerstr. 10
82008 Unterhaching
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www.hy-line.de/computer

Confidential Document

DATA IMAGE CORPORATION

CTP Module Specification
Preliminary
ITEM NO.:   SCF1001XXXGGU11

Table of Contents

Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	ALEX	JOE	GARY	KEN
Approved by	Version:	Issued Date:	Sheet Code:	Total Pages:
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2. RECORD OF REVISION

Rev	Date	Item	Page	Comment
1	27/MAY/13'			Initial PRELIMINARY

3. GENERAL SPECIFICATIONS

Composition: A touch panel module with 10.1 inches Capacitive Touch Panel (CTP) .

Interface: I^{2}C for the CTP.

Parameter	Specifications		Unit
Screen size	10.1(Diagonal)		inch
Display resolution	1,280(H) x (R,G,B) x 800(V)		dot
LCD active area	216.96(H)x135.6(V)		mm
Sensor active area	217.96W) x 137.6(H)		mm
Outline Dimension	253.9(W) x 170H) x 4.6(D)		mm
Dot pitch	0.0565(H)x0.1695(V)		mm
Color configuration	R.G.B. Stripe		
Weight	TBD		g
Surface treatment	Anti-Glare		
View Angle direction	All		
Operating temperature	Ambient temperature	-20 ~ 70	℃
Operating temperature	Ambient temperature	-30 ~ 80	
Our components and processes are compliant to RoHS standard			

4. LCD ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Max	Unit	Remark
Power Voltage	VDD	-0.3	5.0	V	VSS=0V,TA=25℃
	LED_VCCS	-0.3	6.5	V	
Operating Temperature	TOP	0	50	℃	
Storage Temperature	TST	-20	60	℃	

Note 1:

The absolute maximum rating values of this product are not allowed to be exceeded at any times.

Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.
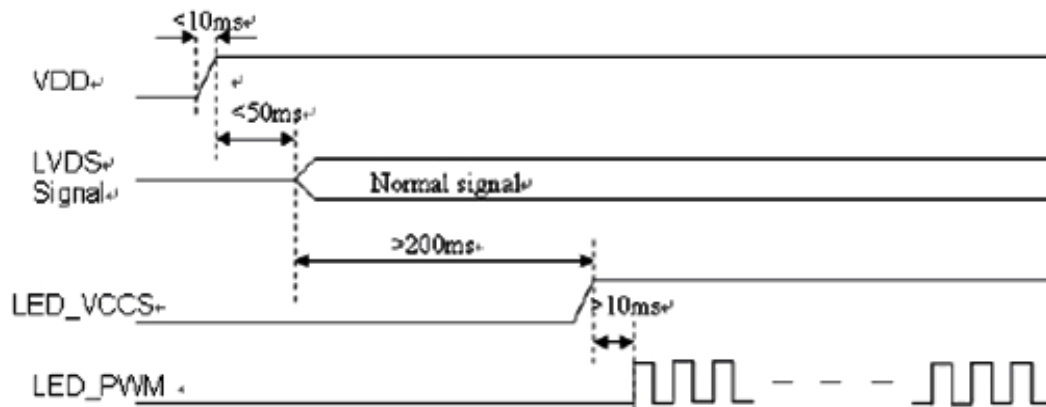
5. LCD ELECTRICAL CHARACTERISTICS

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	VDD	3.0	3.3	3.6	V	
	LED_VCCS	4.8	5.0	6.2	V	
Input logic high voltage	VIH	3.0	3.3	3.6	V	
Input logic low voltage	VIL	0	-	0.5	V	
Current for Driver	IVDD	-	-	350	mA	VDD=3.3V
	ILED_VCCS	-	-	900	mA	LED_VCCS=5V,Duty=100%

PWM Control Level	PWM High Level	3.0	-	3.6	V	
	PWM Low Level	0	-	0.4	V	
PWM Control Frequency	fPWM	1K	-	20K	Hz	

5.1Power Sequence

a. Power on:

b. Power off:
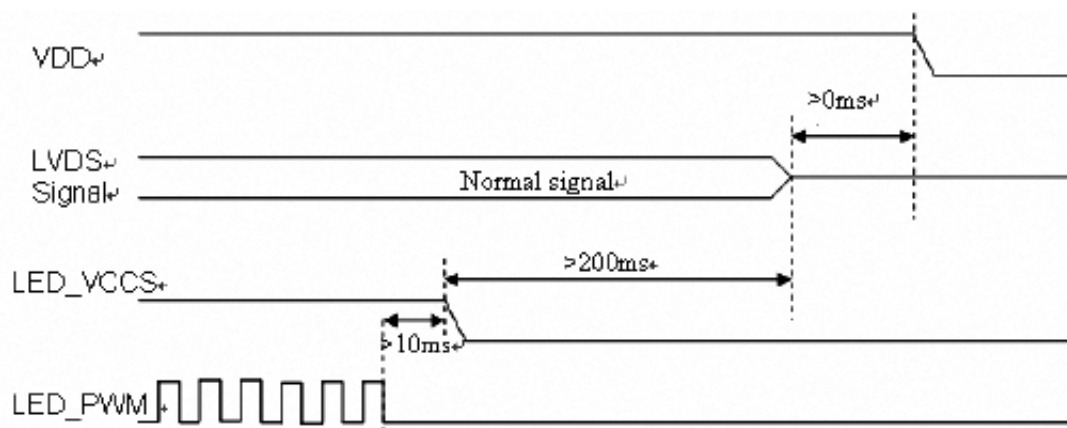
5.2 LVDS Signal Timing Characteristics

5.2.1 AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LVDS Differential input high Threshold voltage	RXVTH	-	-	+100	mV	RXVCM=1.2V
LVDS Differential input Low Threshold voltage	RXVTL	-100	-	-	mV	
LVDS Differentia input Common mode voltage	RXVCM	0.7	-	1.6	V	
LVDS Differential voltage	|VID|	250	-	600	mV	
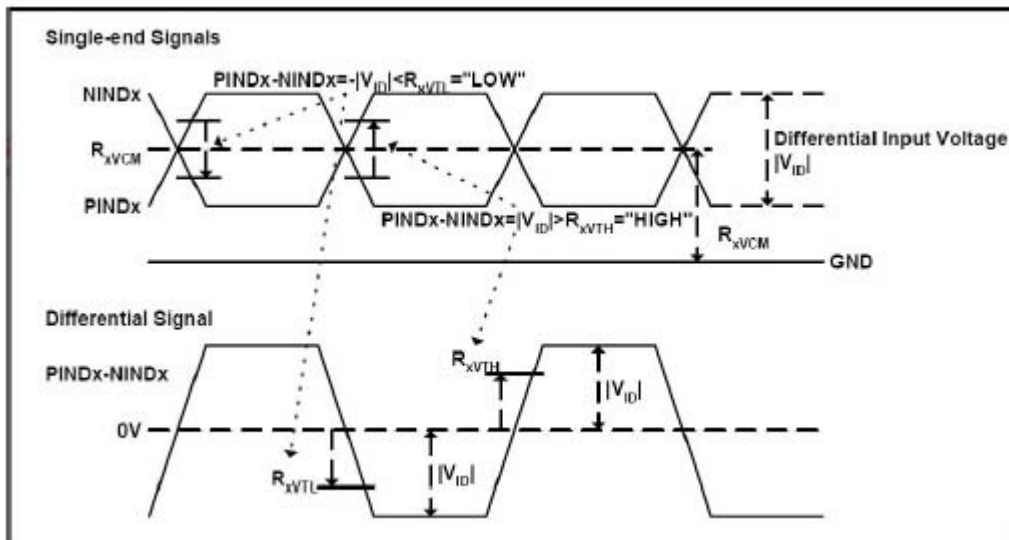
5.2.2 Timing Table

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	1/Tc	(68.9)	71.1	(73.4)	MHz	Frame rate=60Hz
Horizontal display area	t_{HD}		1280		Tc	
HS period time	t_H	(1410)	1440	(1470)	Tc	
HS Width + Back Porch + Front Porch	$t_{HW}+t_{HBP}+t_{HFP}$	(60)	160	(190)	Tc	
Vertical display area	t_{VD}		800		t_H	
VS period time	t_V	(815)	823	(833)	t_H	
VS Width + Back Porch + Front Porch	$t_{VW}+t_{VBP}+t_{VFP}$	(15)	23	(33)	t_H	
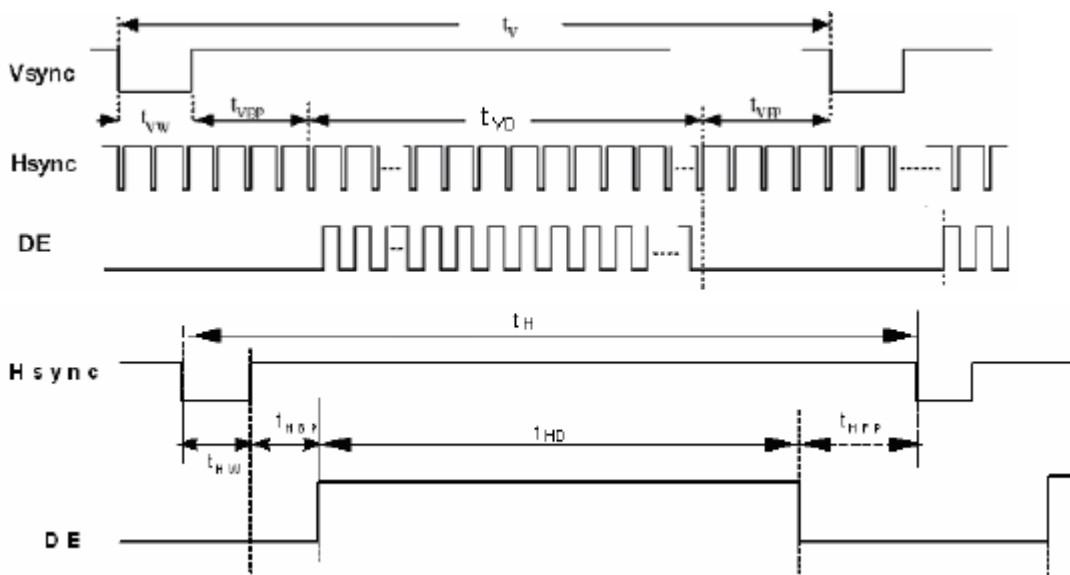
5.2.3 LVDS Data Input Format
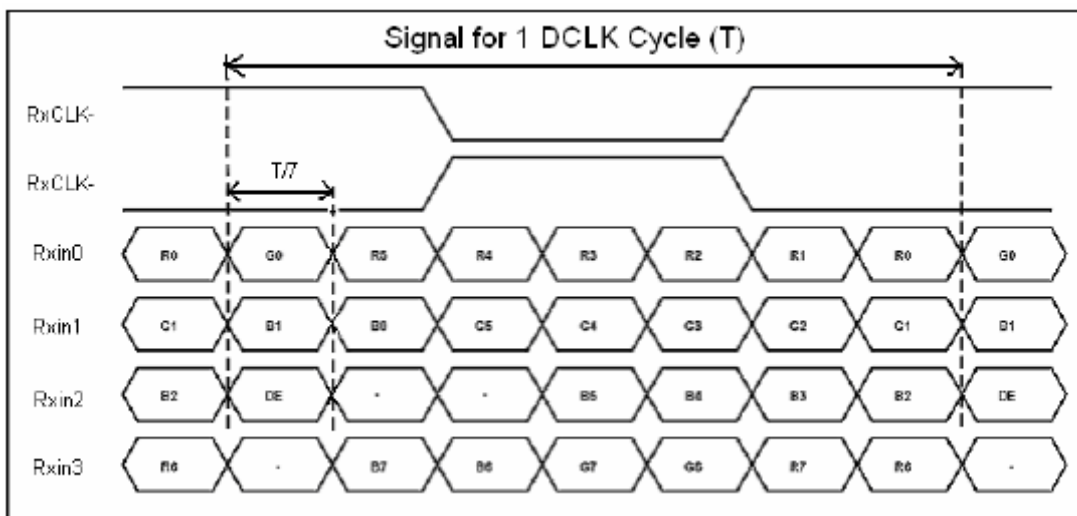
6. LCD PIN CONNECTIONS

Pin #	Signal Name	I/0	Description	Remarks
1	NC	--	No connection	
2	VDD	P	Power supply	
3	VDD	P	Power supply	
4	NC	--	No connection	
5	NC	--	No connection	
6	NC	--	No connection	
7	NC	--	No connection	
8	Rxin0-	I	−LVDS differential data input	R0~R5,G0
9	Rxin0+	I	+LVDS differential data input	
10	VSS	P	Ground	
11	Rxin1-	I	−LVDS differential data input	G1~G5,B0,B1
12	Rxin1+	I	+LVDS differential data input	
13	VSS	P	Ground	
14	Rxin2-	I	−LVDS differential data input	B2~B5,HS,VS,DE
15	Rxin2+	I	+LVDS differential data input	
16	VSS	P	Ground	
17	RxCLK-	I	−LVDS differential clock input	LVDS CLK
18	RxCLK-+	I	+LVDS differential clock input	
19	VSS	P	Ground	
20	Rxin3-	I	−LVDS differential data input	R6,R7,G6,G7,B6,B7
21	Rxin3+	I	+LVDS differential data input	
22	VSS	P	Ground	
23	LED_GND	P	LED Ground	
24	LED_GND	P	LED Ground	
25	LED_GND	P	LED Ground	
26	NC	--	No connection	
27	LED_PWM	I	PWM control signal of LED converter	Note2
28	NC	--	No connection	
29	CABC_EN	I	CABC enable input	Note1
30	NC	--	No connection	
31	LED_VCCS	P	LED Power	
32	LED_VCCS	P	LED Power	
33	LED_VCCS	P	LED Power	
34	NC	-	No connection	
35	NC	-	No connection	

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36	NC	-	No connection	
37	NC	-	No connection	
38	NC	-	No connection	
39	NC	-	No connection	
40	NC	-	No connection	

I: input, O: output, P: Power

Note1: The setting of CABC function are as follows.

Pin	Enable	Disable
CABC_EN	High Voltage	Low Voltage or open

Note2: LED_PWM is used to adjust backlight brightness.
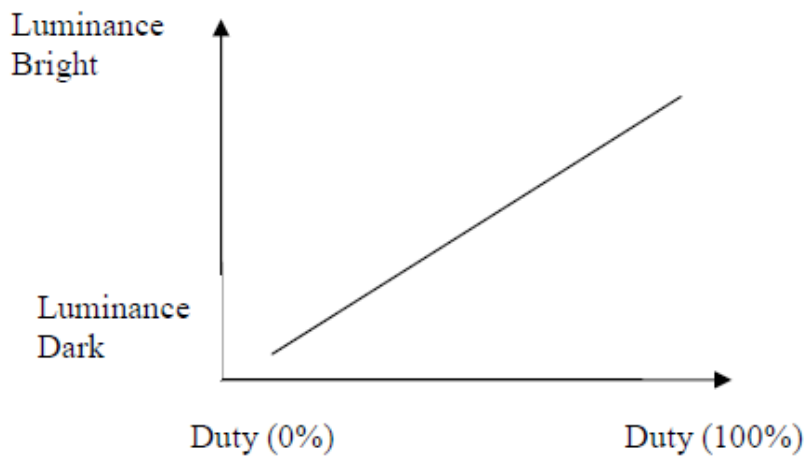
7. OPTICAL CHARACTERISTIC

Parameter		Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remarks
Viewing Angle	Horizontal	θ_x+	Center CR≥10	75	85	--	deg	Note 1,4
		θ_x-		75	85	--		
	Vertical	θ_Y+		75	85	--		
		θ_Y-		75	85	--		
Contrast Ratio		CR	at optimized viewing angle	600	800			Note 1,3
Response time	Rise	Tr	Center	-	15	20	ms	Note 1,6
	Fall	Tf	$\theta x=\theta y =0°$	-	35	30	ms	
Uniformity		B-uni	$\theta x=\theta y =0°$	70	75	--	%	Note1,5
Center Brightness		L	$\theta x=\theta y =0°$	230	290	--	cd/㎡	Note 1,2
Chromaticity	x_W		Center	0.26	0.31	0.36	--	Note 1,7
	y_W		$\theta x=\theta y =0°$	0.28	0.33	0.38	--	

Test Conditions:

1. VDD=3.3V, IL=240mA (Backlight current), the ambient temperature is 25℃.

2. The test systems refer to Note 2.

Note 1: Definition of viewing angle range

Fig. 7-1 Definition of viewing angle   Φ=270°
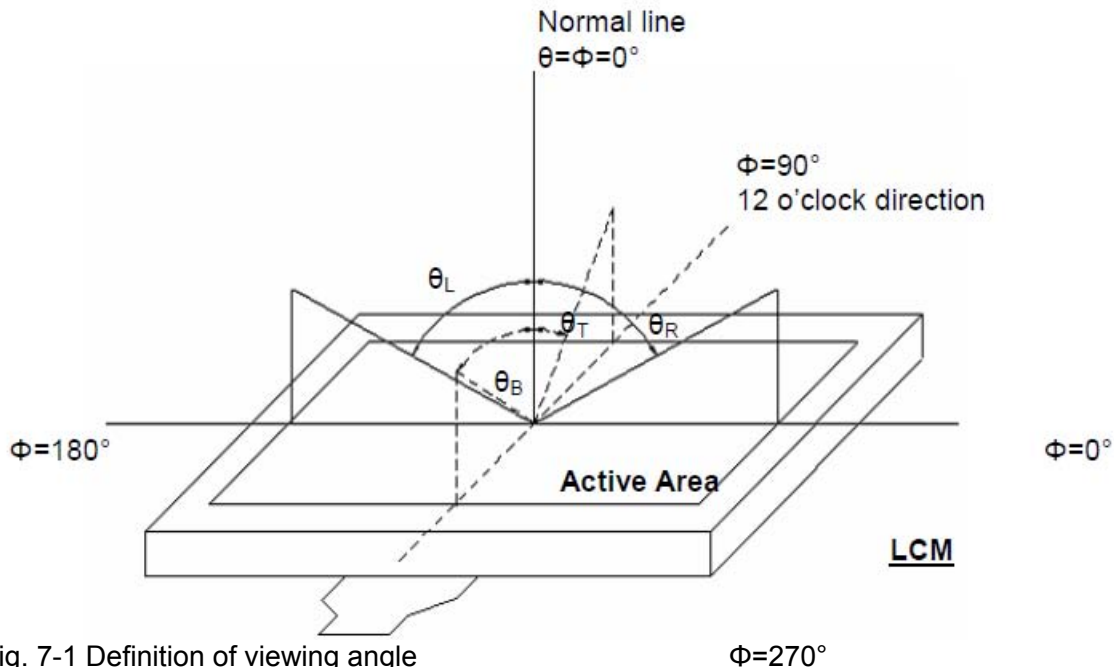
Note 2: Definition of optical measurement system.   6 o'clock
The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm, Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/ Field of view: 1° /Height: 500mm.)
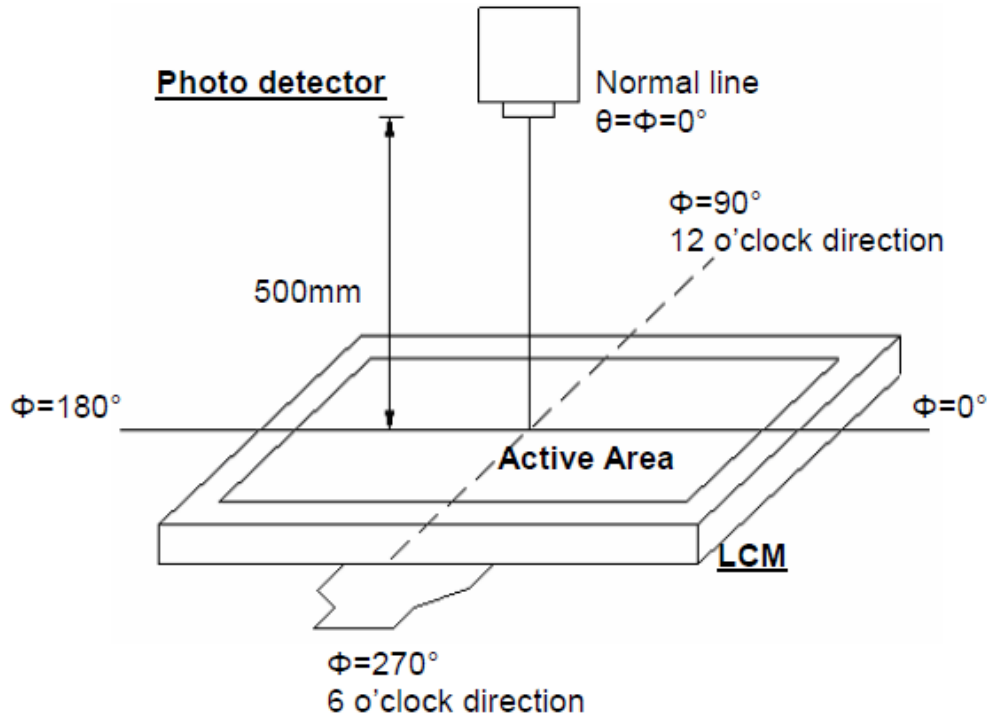
Fig. 7-2 Optical measurement system setup

Note 3: Definition of Response time
The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.
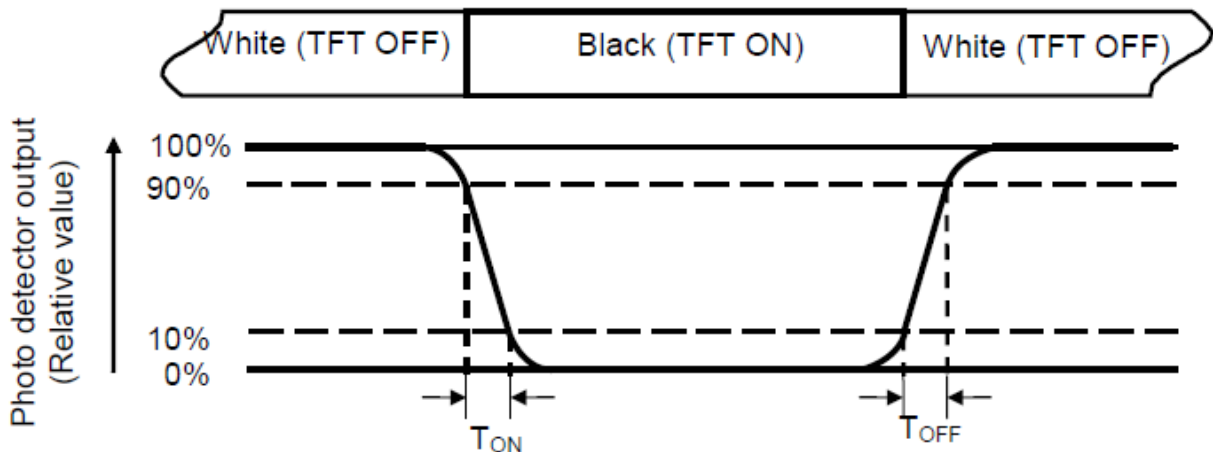

Fig. 4-3 Definition of response time

Note 4: Definition of contrast ratio

$$CR = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

The LED driving condition is I_L=240mA .
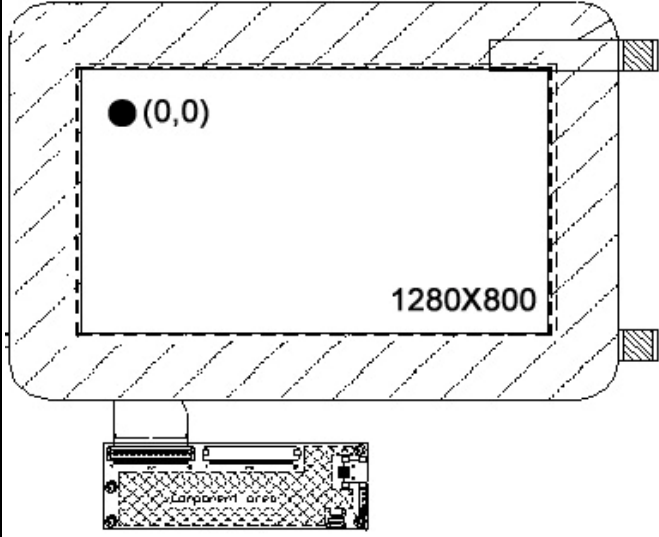
Note 7: Definition of Luminance Uniformity
Measure the luminance of gray level 63 at 9 points
δW9p = {Minimum [L (1)+ L (6)+ L (7)+ L (8)+ L (9)+ L (10)+ L (11) +L (12) +L (13)] /

Maximum [L (1)+ L (6)+ L (7)+ L (8)+ L (9)+ L (10)+ L (11) +L (12) +L (13)]}*100%

8. CTP GENERAL SPECIFICATIONS

8.1 CTP main feature

Item	Specification	Unit
Type	Transparent type projected capacitive touch panel	
Input mode	Human's finger	
Multi touch	2	Point
(X,Y) Position	● (0,0)　　1280X800	

8.2 ABSOLUTE MAXIMUM RATING

Symbol	Description	Min	Typ.	Max	Unit	Notes
VDD	Supply voltage	-0.3	-	3.6	V	
VIO	Input I/O pin voltage	GND-0.3	-	VDD+0.3	V	
I_{VDD}	Supply current			100	mA	

8.3 ELECTRICAL CHARACTERISTIC

Symbol	Description	Min	Typ.	Max	Unit	Notes
VDD	Supply voltage	2.7	3.3	3.6	V	
VIH	Input high level voltage	0.7* VDD		VDD+0.5		
VIL	Input low level voltage	0		0.8		

8.4 PIN CONNECTIONS

Pin Number	Pin Name	Description
1	VDD	Power Supply Voltage
2	SCL	I^2C Clock
3	SDA	I^2C Data
4	/INT	Interrupt active low
5	/RESET	Reset active low
6	GND	Ground

8.5 INTERFACE AND DATA FORMAT (SLAVE ADDRESS IS 0X04H)

Communication protocol: I^{2}C

8.5.1 I^{2}C data Format
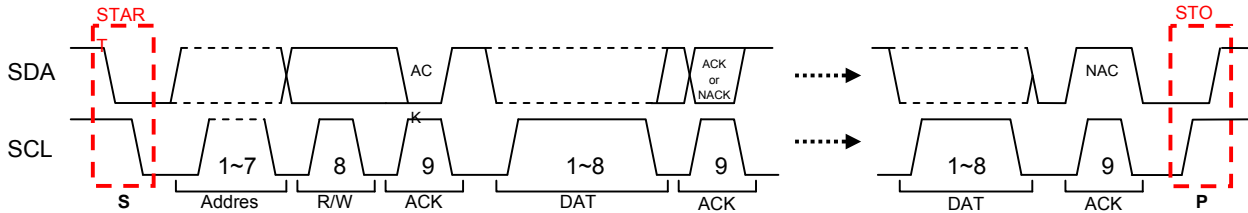
Report rate = 1 / T$_{INT}^s$, it depends on properties of touch screen such as resistive value, channel number, thickness and material of cover lens, etc.

8.5.2 Protocol

Read mode: Master-receiver, slave-transmitter.

S	Address	R	A	DATA1	A	DATA2	A	……………...	DATA9	A	DATA10	N	P

Write mode: Master-transmitter, slave-receiver

S	Address	W	A	DATA1	A	DATA2	A	……………...	DATA9	A	DATA10	A	P

	From Host to Device
	From Device to Host

S	START condition
P	STOP condition
R	Data direction READ (SDA HIGH)
W	Data direction WRITE (SDA LOW)
A	Acknowledge (SDA LOW)
N	Not acknowledge (SDA HIGH)
Address	7-bit
DATA	8-bit

Software protocol

I2C transaction frame each i2c transaction frame transfers one i2c packet data.
Each i2c packet data may not be an exact application packet.

From host to device:

Report id=3 (Diagnostics mode)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9
0x03	len	D1	D2	D3	D4	D5	D6	D7	D8

len = valid data length in bytes of the current i2c data packet.
D1 to DN totally N bytes are valid data in this current i2c data packet.
N<=8. This Report ID= 3 is used for diagnostics

From Device to Host:

Host computer poll this i2c device only when the interrupt pulled low by this touch device.

The host computer should not poll this device when this interrupt signal pulled high.

The packet size of each i2c transaction frame is defined as 10 bytes

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9
ID	D0	D1	D2	D3	D4	D5	D6	D7	D8

ID is defined as Report ID. The report ID was defined as below

Report ID =3 (Diagnostics mode)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9
0x03	len	D1	D2	D3	D4	D5	D6	D7	D8

Len = valid data length in bytes of the current i2c data packet.

D1 to DN totally N bytes are valid data in this current i2c data packet.

N<=8.This Report ID is Use for diagnostics.

Report ID =4 (Multi-Touch report)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9
0x04	D0	D1	D2	D3	D4	D5	D6	D7	D8

D0: B7=Touch Valid. B7 = 1 is valid touch

[B6:B2] = Contact ID.

B1 = In Range bit, this bit should be always 1

B0 = Down/Up bit, B0 = 1 for Touch Down, B0 = 0 for Lift Off

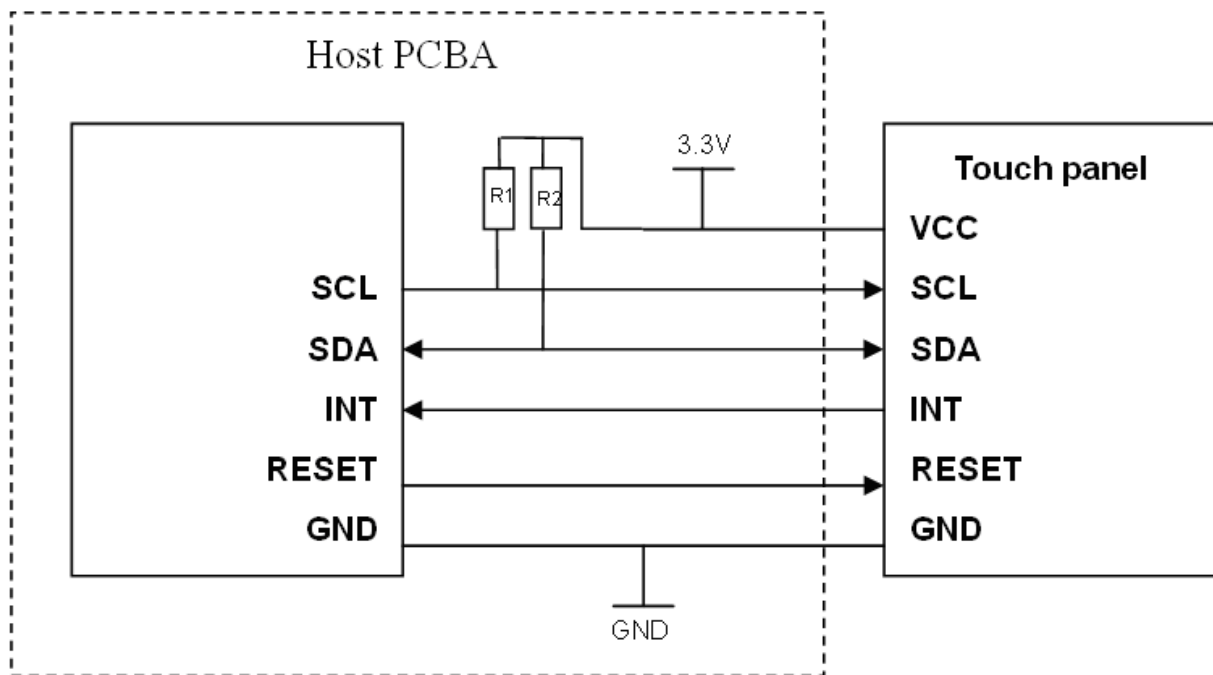D1= Low byte of X coordination

D2= High byte of X coordination

D3= Low byte of Y coordination

D4= High byte of Y coordination

D5= Low byte of Z coordination

D6= High byte of Z coordination

D7, D8 = reserved and must be zero.

8.6 BLOCK DIAGRAM

Note 1 : To reduce the noise from the power, we suggest you use the independent power for the touch panel (VCC)

Note 2 : Use appropriate pull high resistor on SDA and SCL. Suggestion: 4.7K Ohm.

9. QUALITY ASSURANCE

9.1 Test Condition

9.1.1 Temperature and Humidity (Ambient Temperature)

Temperature : $25 \pm 5°C$

Humidity : $65 \pm 5\%$

9.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

9.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

91.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

9.1.5 Test Method

No.	Reliability Test Item & Level	Test Level	Remark
1	High Temperature Storage Test	T=80°C,240hrs	IEC68-2-2
2	Low Temperature Storage Test	T=-30°C,240hrs	IEC68-2-1
3	High Temperature Operation Test	T=70°C,240hrs	IEC68-2-2
4	Low Temperature Operation Test	T=-20°C,240hrs	IEC68-2-1
5	High Temperature and High Humidity Operation Test	T=60°C,90% RH,240hrs	IEC68-2-3
6	Thermal Cycling Test (No operation)	-30°C $\rightarrow$ +25°C $\rightarrow$ +80°C,200 Cycles 30 min 5min 30 min	IEC68-2-14
7	Vibration Test (No operation)	Frequency:0 ~ 55 Hz Amplitude:1.5 mm Sweep Time:11min Test Period:6 Cycles for each Direction of X,Y,Z	IEC68-2-6
8	Electrostatic Discharge Test (No operation)	150pF,330Ω Air:$\pm$ 15KV;Contact: $\pm$8KV 10 times/point;4 points/panel face	IEC-61000-4-2

9.2 Inspection condition

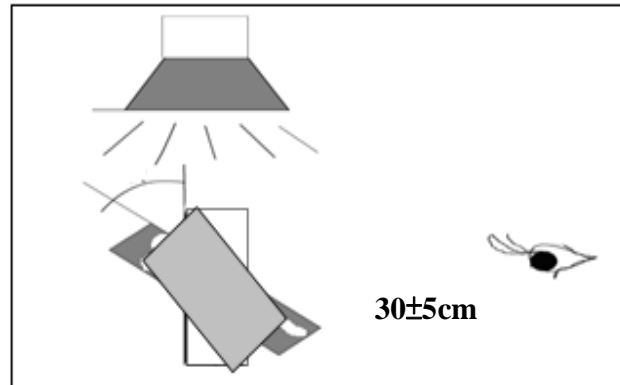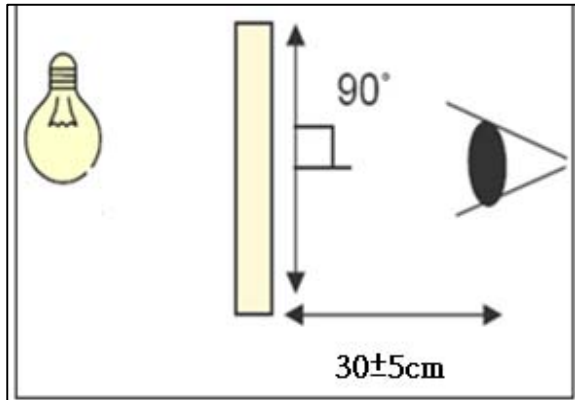9.2.1 Inspection conditions

9.2.2Inspection Distance : 30 ± 5 cm

9.2.3.1View Angle :

(1) Inspection that light pervious to the product: 90±15°
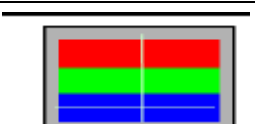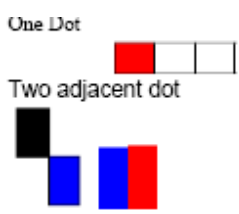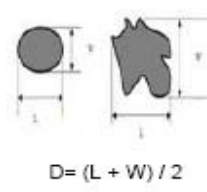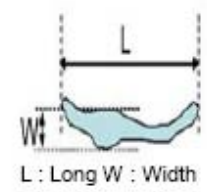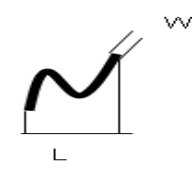
(2) Inspection that light reflects on the product: 90±15°

9.3 Environment conditions:
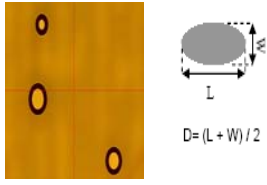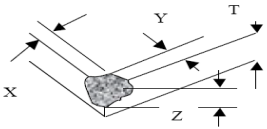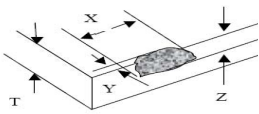
Ambient Temperature :	25±5℃
Ambient Humidity :	30~75%RH
Ambient Illumination	600~800 lux

9.4 Inspection Parameters

Appearance inspection standard (D: diameter, L: length; W: width, Z: height, T: glass thickness)

Inspection item	Inspection standard	Description
No image	Prohibited	
Image abnormal	Prohibited	
Bright line	Prohibited	
Thin line	It is acceptable that the defect can not be seen with 10% ND filter.	
Mura	It is acceptable that the defect can not be seen with 5% ND filter.	

Dot	Item	Acceptable	Total	
		Visible area		
	Bright dot	3	6	
	Dark dot	5		
	Bright adjacent dots	1	1	
	Dark adjacent dots	2	2	
	Adjacent dots with a bright dot and a dark dot	2	2	

One Dot

Two adjacent dot

Foreign material in dot shape	SPEC (unit: mm)	Acceptable	
	D≦0.5	Ignored	
	0.5<D≦0.8, distance>5	n≦5	
	D＞0.8	0	

D= (L + W) / 2

Foreign material in line shape	SPEC	Acceptable	
	W≦0.05 and L≦10	Ignored	
	0.05<W≦0.1, L≦10, distance >5	n≦5	
	W>0.1 or L>10	0	

L : Long W : Width

Contamination	It is acceptable if the dirt can be wiped.	

Inspection item	SPEC	Description

Scratch	SPEC	Acceptable	
	W≦0.05 and L≦10	Ignored	
	0.05<W≦0.08, L≦10, distance >5	n≦5	
	0.08<W≦0.1, L≦10, distance >5	n≦3	
	W>0.1 or L>10	0	

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Bubble	SPEC (unit: mm)	Acceptable	
	D≦0.3	Ignored	
	Non visible area	Ignored	
	0.3<D≦0.5, distance >5	n≦5	
	D＞0.5	0	

Cover & Sensor Crack	Prohibited		

Cover angle missing	SPEC (unit: mm)	Acceptable	
	Side/Bottom	Ignored	
	It is prohibited if the defect appears on the front.	0	

Cover edge break	SPEC (unit: mm)	Acceptable	
	X≦3.0, Y≦3.0, Z≦T	Ignored	
	X>3.0, Y>3.0, Z＞T	0	

Inspection item	SPEC		Description
Ink	SPEC (unit: mm)	Acceptable	
	word unclear, inverted, mistake, break line	0	
Bubble under protection film	SPEC (unit: mm)	Acceptable	
	NA		
Function	Prohibited		

9.5 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.
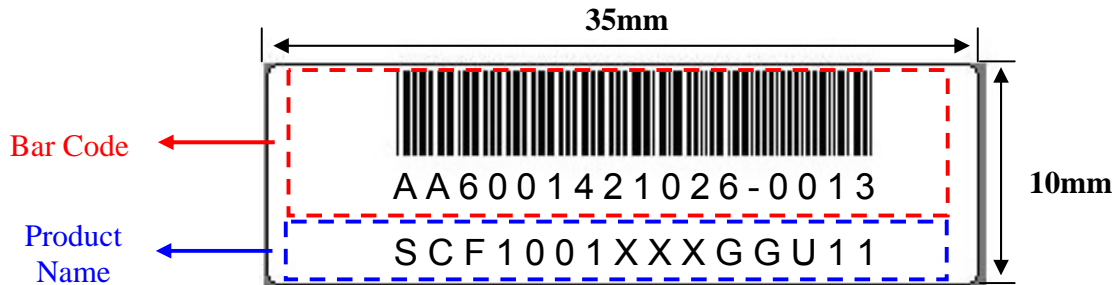Sampling type: normal inspection, single sampling
Sampling table: MIL-STD-105E
Inspection level: Level II

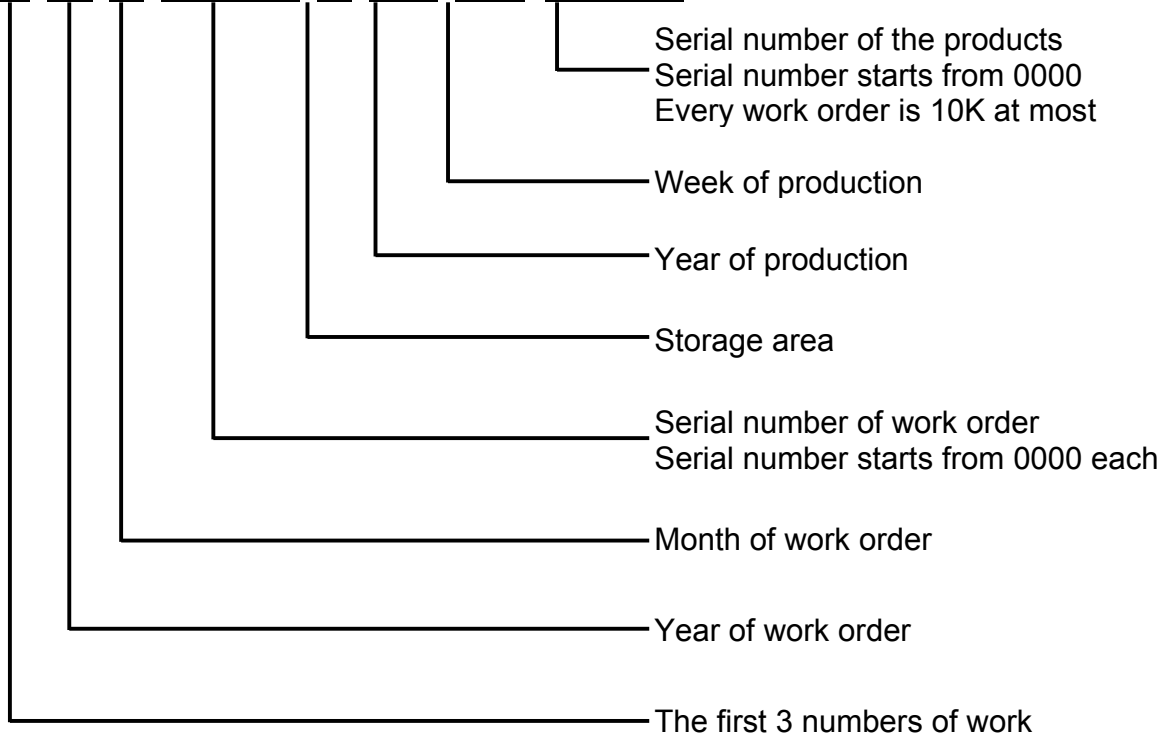|			Definition
Class of defects	**Major**	AQL 0.65%	It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
	Minor	AQL 1.5%	It is a defect that will not result in functioning problem with deviation classified.

10. LCM PRODUCT LABEL DEFINE

Product Label style:

35mm

Bar Code → AA6001421026-0013

Product Name → SCF1001XXXGGU11

10mm

Bar Code Define:

AA6 0014 2 10 26-0013

Serial number of the products
Serial number starts from 0000
Every work order is 10K at most

Week of production

Year of production

Storage area

Serial number of work order
Serial number starts from 0000 each

Month of work order

Year of work order

The first 3 numbers of work

Product Name Define:

SC F 1001 XXX G G U 11

Serial Number

Material of Glue

　　N : None
　　U : UV
　　C : OCA
　　R : Other

Material of Cover Lens

　　N : None
　　G : Glass
　　P : PMMA
　　F : Film
　　E : PET
　　R : Other

Material of Sensor

　　G : Glass
　　F : Film
　　R : Other

IC Number

　　XXX : None IC on CTP FPC

Size

　　1001 : 10.1 inch

Module Type

　　N : None LCM
　　F : Standard CTP Module
　　X : Custom CTP Module

Capacitive Touch Panel

11. PRECAUTIONS IN USE LCM

1. ASSEMBLY PRECAUTIONS
    (1) You must mount a module using holes arranged in four corners or four sides.
    (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
    (3) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
    (4) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
    (5) Do not open the case because inside circuits do not have sufficient strength.
    (6) Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
    (7) Please do not touch metal frames with bare hands and soiled gloves. A color change of the metal frames can happen during a long preservation of soiled LCD modules.
    (8) Please pay attention to handling lead wire of backlight so that it is not tugged in connecting with inverter.
2. OPERATING PRECAUTIONS
    (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
    (2) Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification
    (3) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
    (4) When fixed patterns are displayed for a long time, remnant image is likely to occur.
    (5) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
    (6) Please consider that LCD backlight takes longer time to become stable of radiation characteristics in low temperature than in room temperature.
3. ELECTROSTATIC DISCHARGE CONTROL
    (1) The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such the copper leads on the PCB and the interface terminals with any parts of the human body.

(2) The modules should be kept in antistatic bags or other containers resistant to static for storage.
(3) Only properly grounded soldering irons should be used.
(4) If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.
(5) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended
(6) Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.
4. STORAGE PRECAUTIONS
    (1) When you store LCDs for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
    (2) Please do not leave the LCDs in the environment of high humidity and high temperature such as 60°C 90%RH
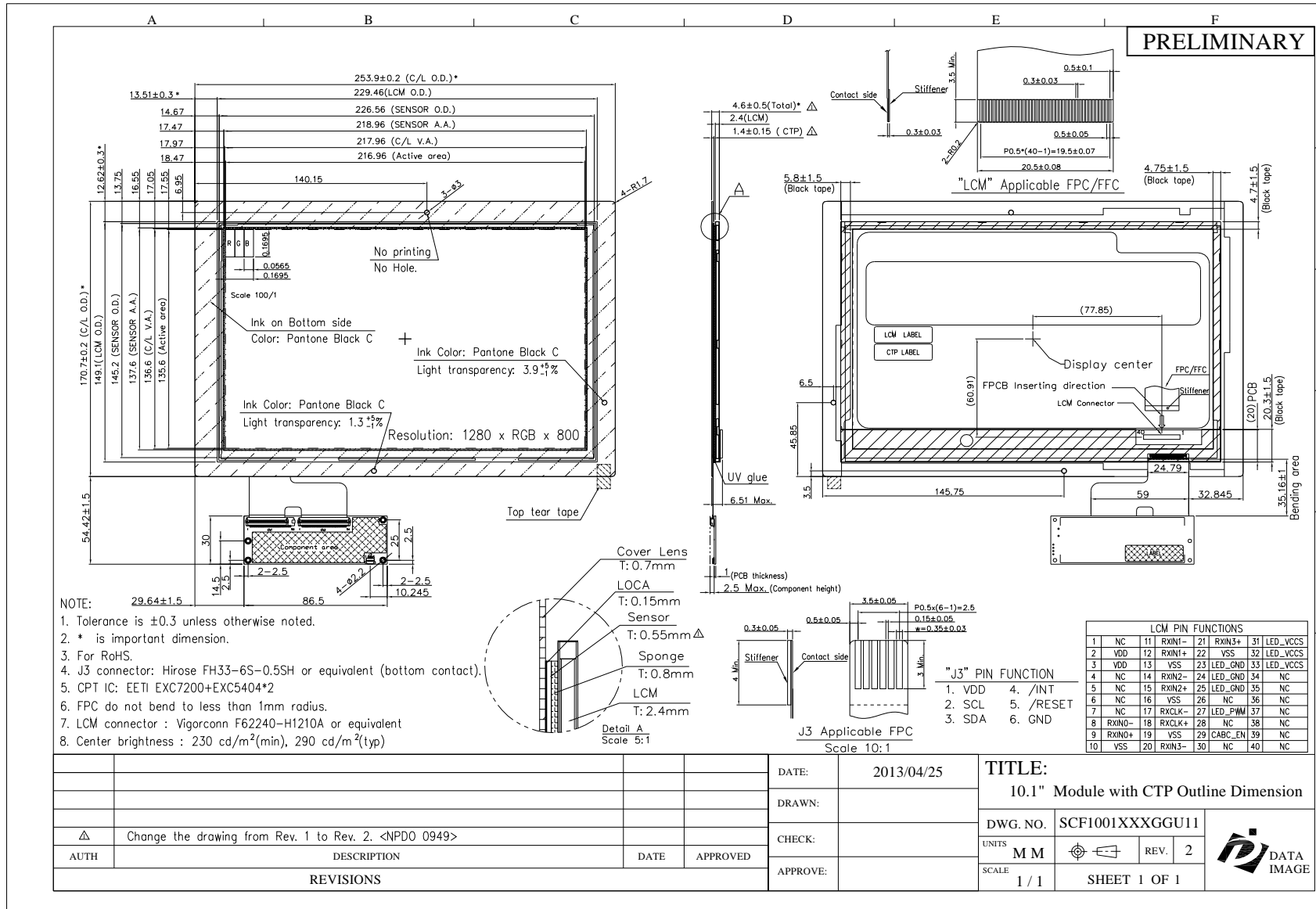   (3) Please do not leave the LCDs in the environment of low temperature; below -20°C.
5. OTHERS
    (1) A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight Land strong UV rays
    (2) Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
    (3) For the packaging box, please pay attention to the followings:
      a. Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
      b. Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
      c. Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

6. LIMITED WARRANTY
    Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not responsible for any subsequent or consequential events.

12. OUTLINE DRAWING

13. PACKAGE INFORMATION

TBD